

The Odyssey of Sovereign Sustainability

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Sovereign Sustainability

Three topics

- Central banks are special: reserve management and background risk
- Sovereign, Supra and Agency portfolios: trends and double materiality
- Sustainable market and Multilateral Development Banks

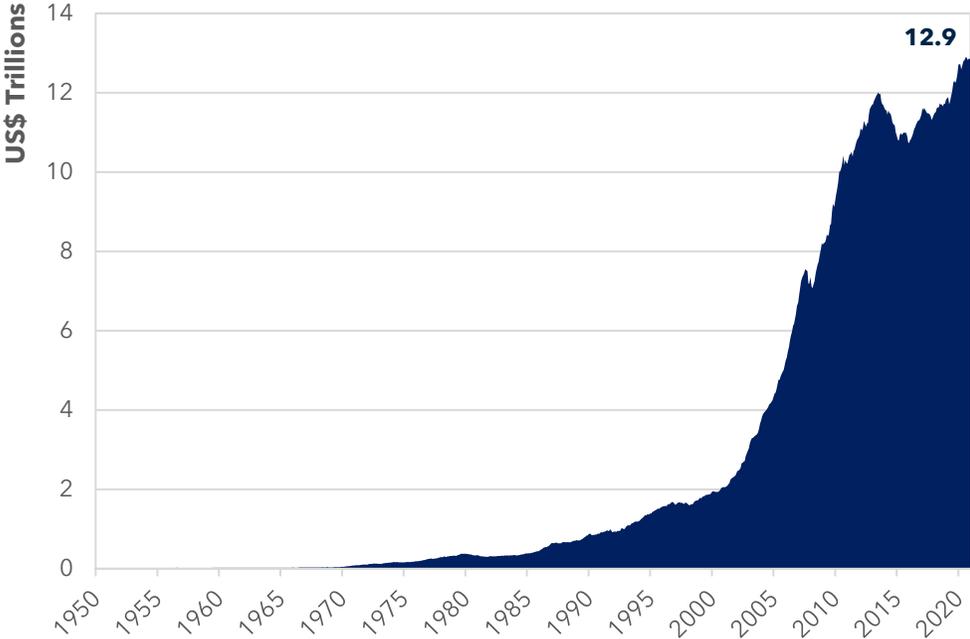
Central banks are special

Reserve managers, risk-aversion and restricted investment universe

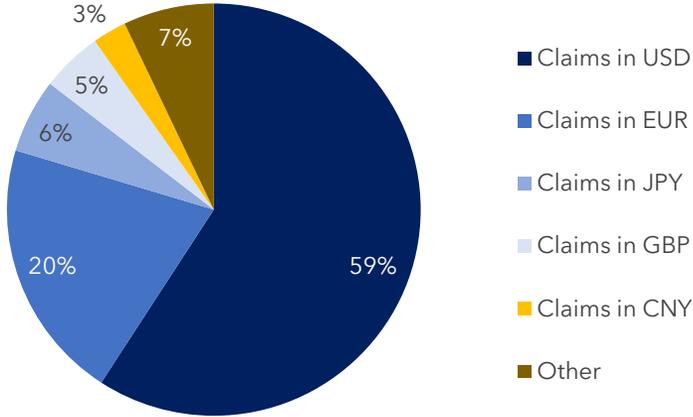
Central Banks' Reserve Management

Currency composition and size

World foreign reserves



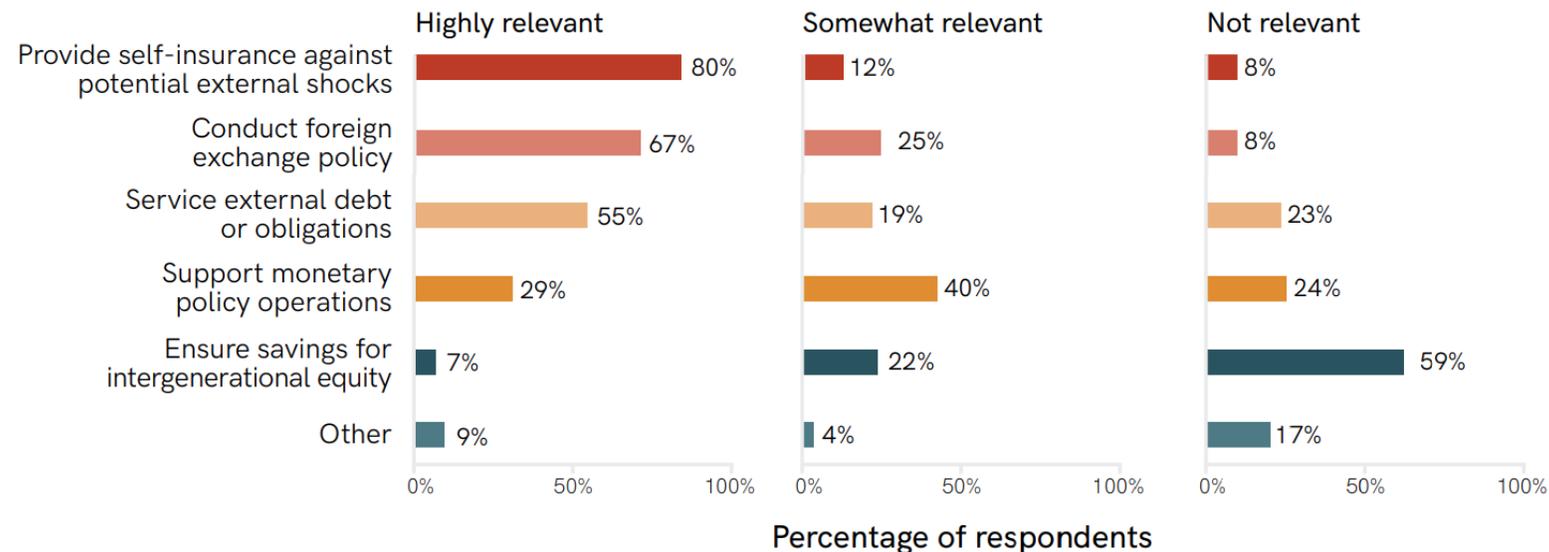
Composition of world foreign reserves



Central Banks' Reserve Management

An introduction

- “Reserve management is a process that ensures that adequate official public sector foreign assets are readily available to and controlled by the authorities for meeting a defined range of objectives for a country or union.”
- Range of objectives:



Note: 119. The responses may not add up to 100 percent as some respondents did not classify all choices presented.

Sources: Guidelines for Foreign Exchange Reserve Management. (IMF, 2001)

Third RAMP Survey on the Reserve Management Practices of Central Banks, based on 2020 data. Authors: Ballon Carneiro, Dongsoo Hong, Klingebiel, Herrero Montes, and Ruiz Gil (2021).

Background Risk

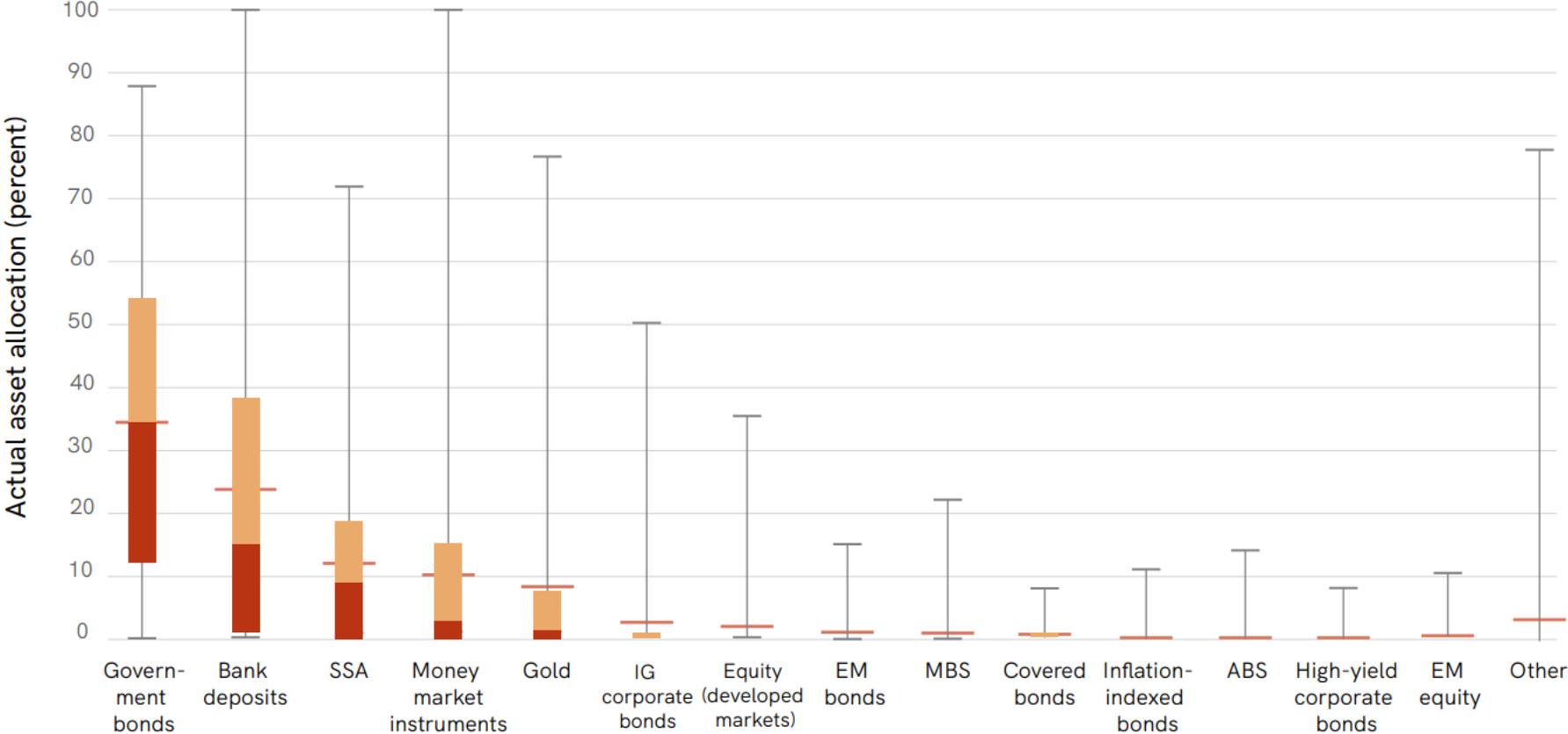
Unhedgeable risk

- **Background risk** is an exogenous and non-hedgeable risk faced by an investor that may affect his/her risk tolerance
- Are central banks more risk-averse and consequently decrease their demand for risky assets due to the external exposure of their currency?
- Gollier and Pratt (1996) introduce the concept of risk vulnerability where risk-averse agents behave in a more risk-averse way with respect to any other dependent risk, due to the addition of an unfair background risk (i.e., associated with a negative risk premium)
- One sufficient condition for **risk vulnerability** is that absolute risk aversion is decreasing and convex, which provides a very general condition applicable to asset allocation problems, including the management of reserves by central banks.

Central bank asset allocation

Challenge 1: central banks mostly invested sovereign, agency, supra and short-term products

Distribution of allocations to individual asset classes

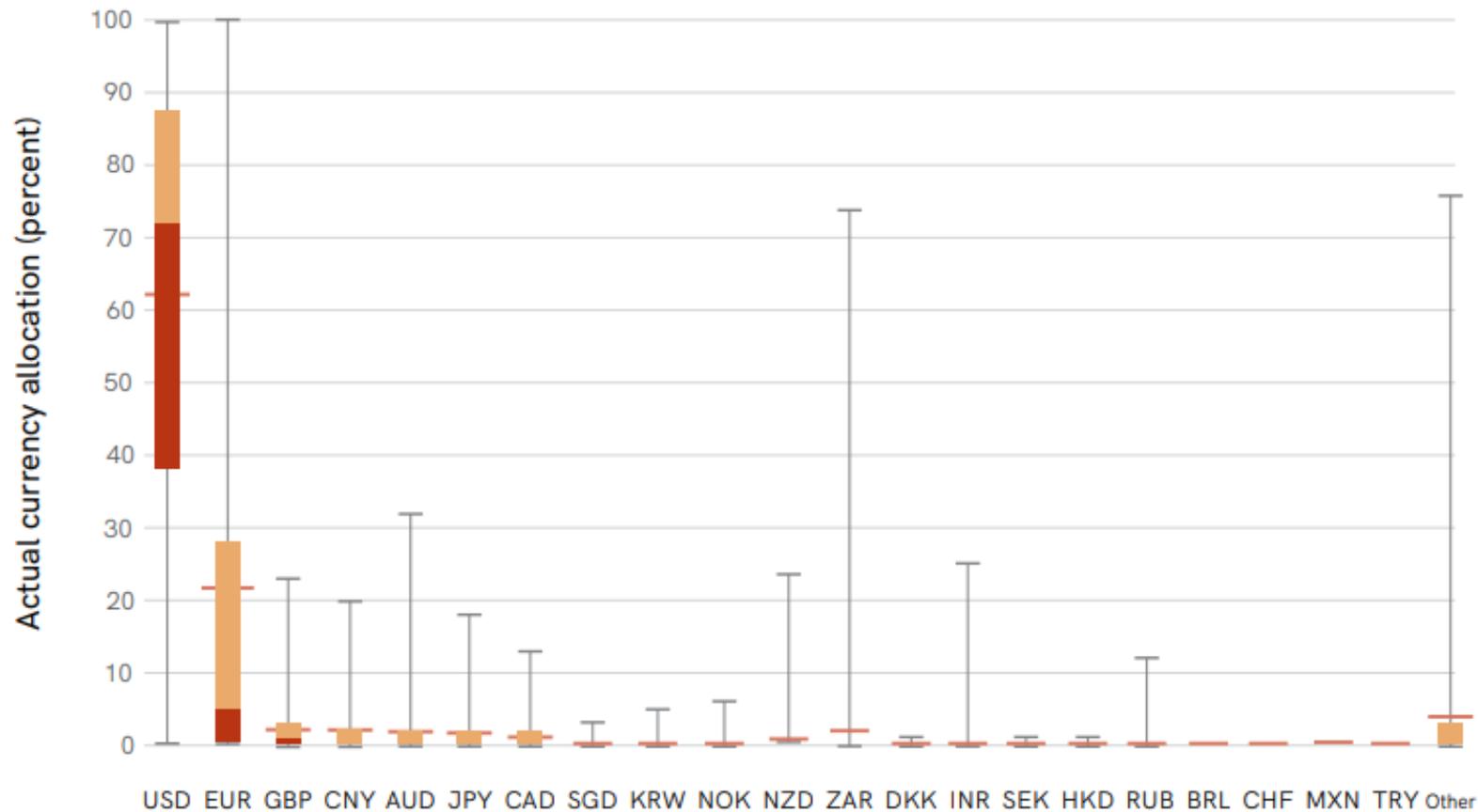


N = 92
 Source: Third RAMP Survey on the Reserve Management Practices of Central Banks, based on 2020 data.

Central bank currency composition

Challenge 2: most meaningful exposures in USD and EUR limiting investment universe

Currency composition of reserve portfolios



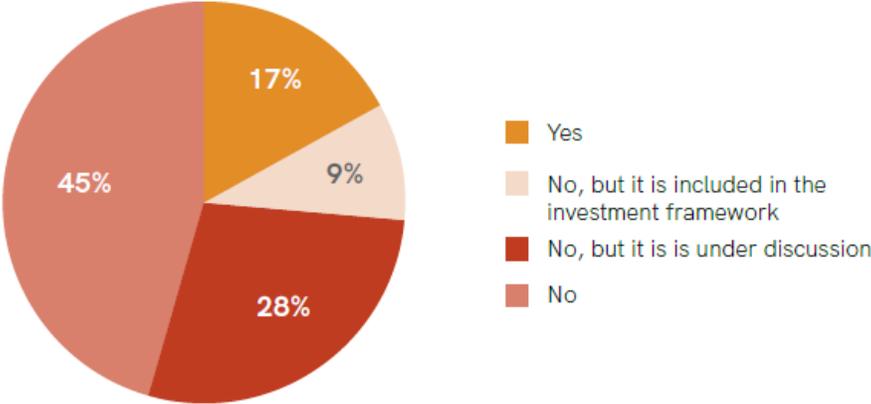
N = 102

Source: Third RAMP Survey on the Reserve Management Practices of Central Banks, based on 2020 data.

Current central bank ESG practices

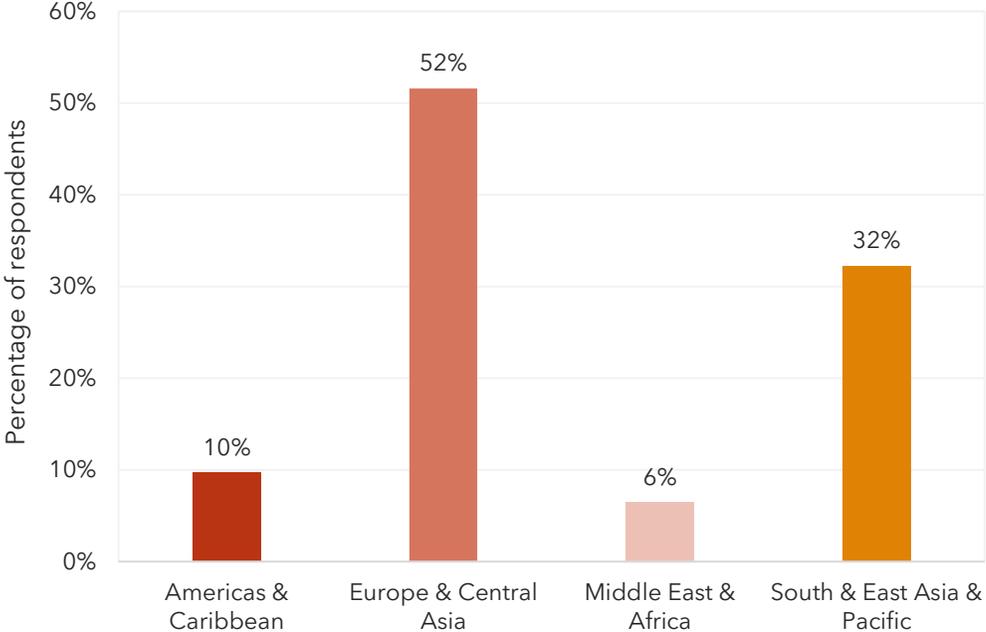
Few central banks have incorporated ESG practices. More interest in Europe and Asia.

Central banks considering ESG



N = 117
Source: Third RAMP Survey on the Reserve Management Practices of Central Banks, based on 2020 data.

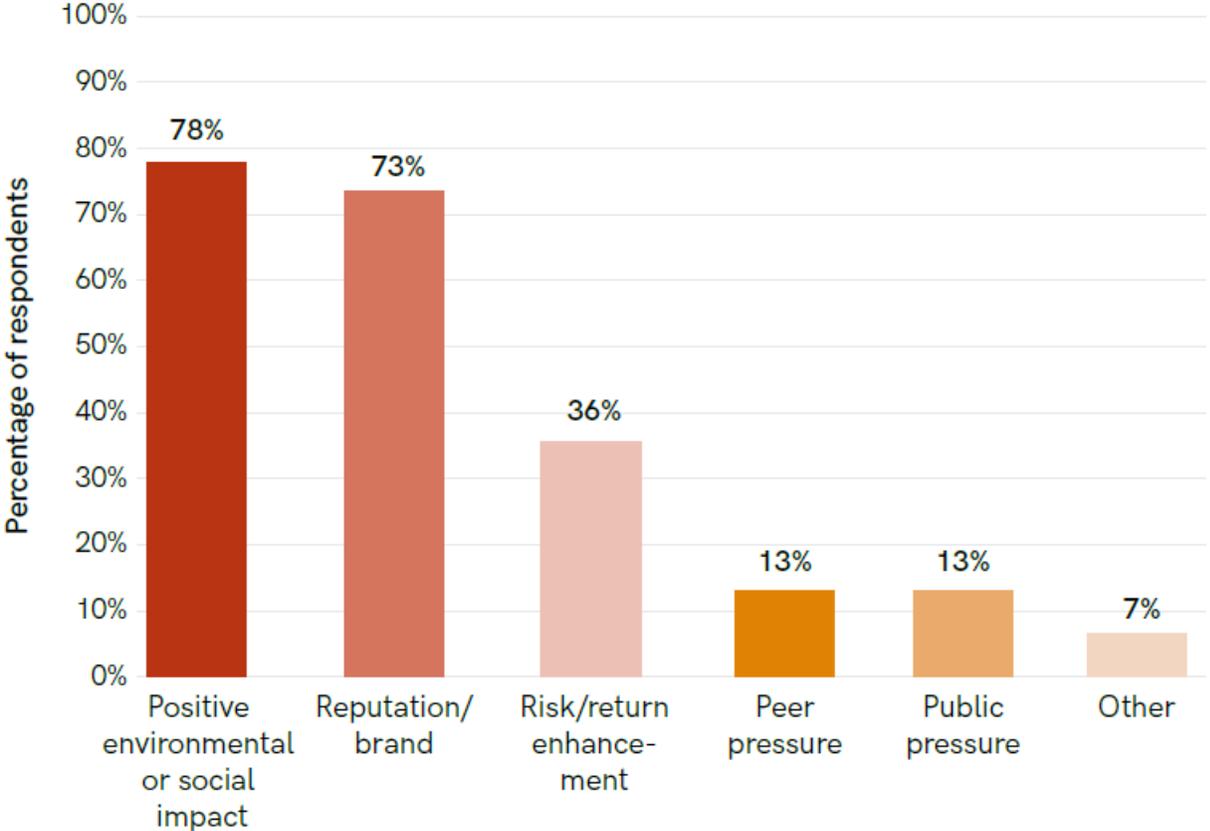
Geographical distribution of central banks that have included ESG in their investment policy and/or investment framework



N = 31
Source: Third RAMP Survey on the Reserve Management Practices of Central Banks, based on 2020 data.

Motivating factors to consider ESG for central banks

Reputational factors and impact are the main motivating factors



N = 45
Source: Third RAMP Survey on the Reserve Management Practices of Central Banks, based on 2020 data.

Current central bank ESG practices

Impact investing with thematic bonds is the preferred ESG strategy

**ESG strategies used by asset class
(percentage of institutions with ESG)**

	Government/ SSA bonds	Corporate bonds	High-yield bonds	Equity
Negative/exclusionary screening	32%	45%	10%	32%
Positive/best-in-class screening	16%	16%	0%	6%
ESG integration	23%	35%	10%	16%
Impact investing (i.e., green bonds, social bonds, sustainability bonds)	68%	35%	3%	Not applicable
Impact investing different from green, social, or sustainability bonds	6%	3%	0%	3%
Active ownership and engagement	3%	10%	3%	19%

N = 31

Source: Third RAMP Survey on the Reserve Management Practices of Central Banks, based on 2020 data.

Sustainability and reserve management

Main considerations

- ESG implementation should be **consistent** with reserve management framework
- The **scope** for ESG implementation increases with portfolio diversification
- An ESG policy for reserve management may not be easy to implement for all central banks because of:
 - Regulatory obstacles (e.g., narrow interpretation of fiduciary duty)
 - Lack of diversification
 - Institutional capacity

Network for Greening the Financial System (NGFS)

Set up in 2017, today with 87 members and 13 external observers



1. Integrating climate-related risks into **financial stability monitoring** and **micro-supervision**
2. Integrating sustainability factors into **own-portfolio management**
3. Bridging the data gaps
4. Building **awareness** and **intellectual capacity** and encouraging technical assistance and knowledge sharing

Best practices for NGFS members, non-members financial institutions

5. Achieving robust and internationally **consistent** climate and environment related **disclosure**
6. Supporting the development of a **taxonomy** of economic activities

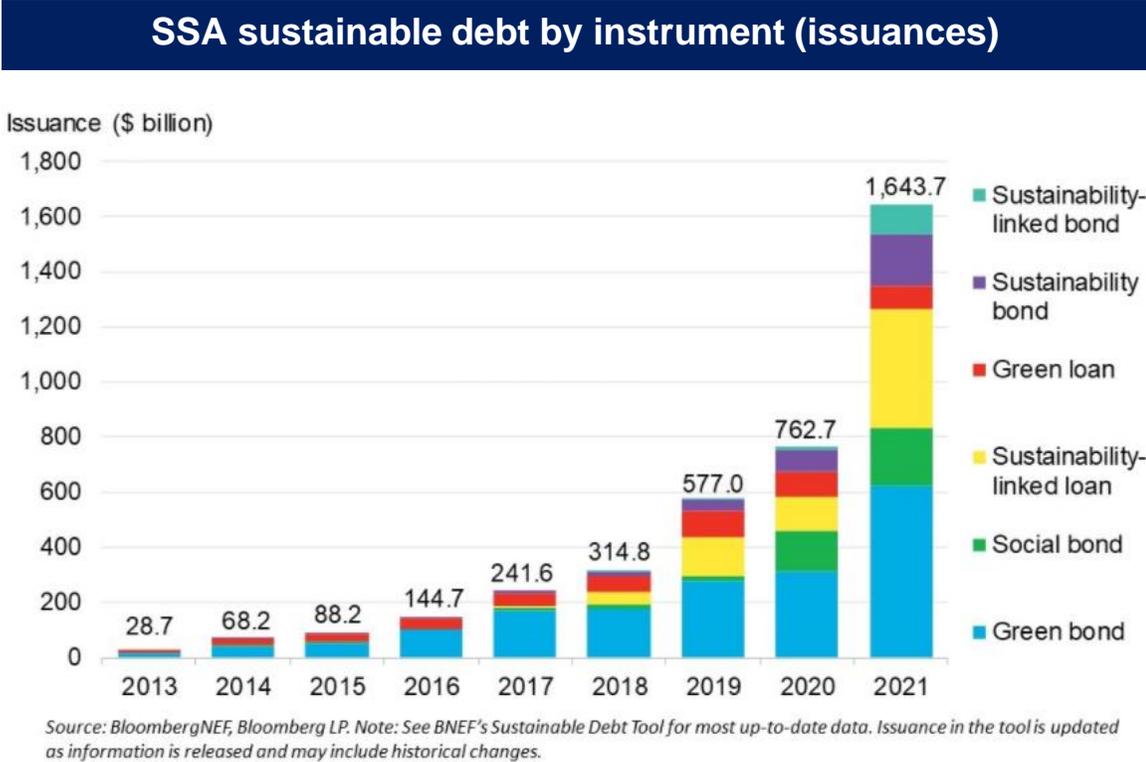
Actions by policymakers

Sovereign, supranational and agency (SSA) portfolios

Trends and double materiality

Sustainable bonds

- Over US\$1.6 trillion issued in 2021, **more than double** the total from 2020 in a market that now exceeds US\$4 trillion (Bloomberg)

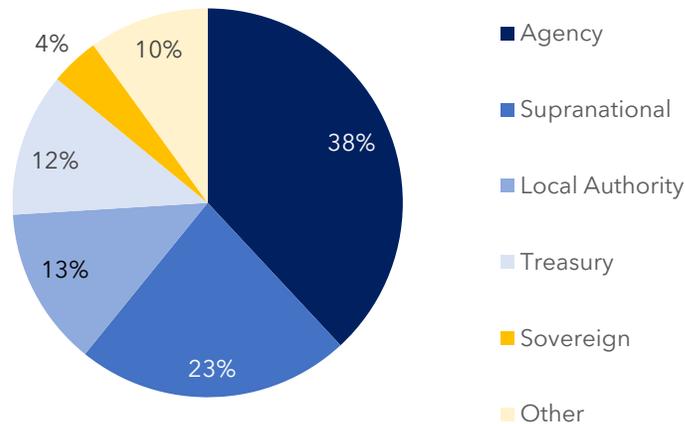


Sustainable bonds

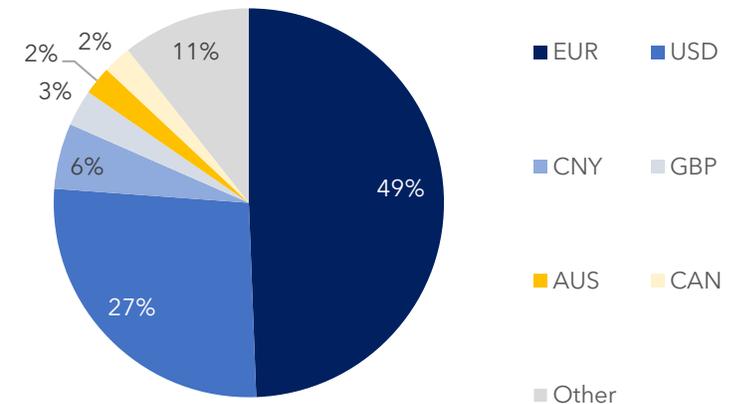
Sovereigns, Supranationals, Agencies (SSA)

- SSA sustainable debt accounts for **more than 50%** of global outstanding sustainable debt*.
- SSA are seeing strong demand for their sustainable instruments and may use it as a way of broadening their investor pool.

SSA Sustainable debt outstanding by issuer type

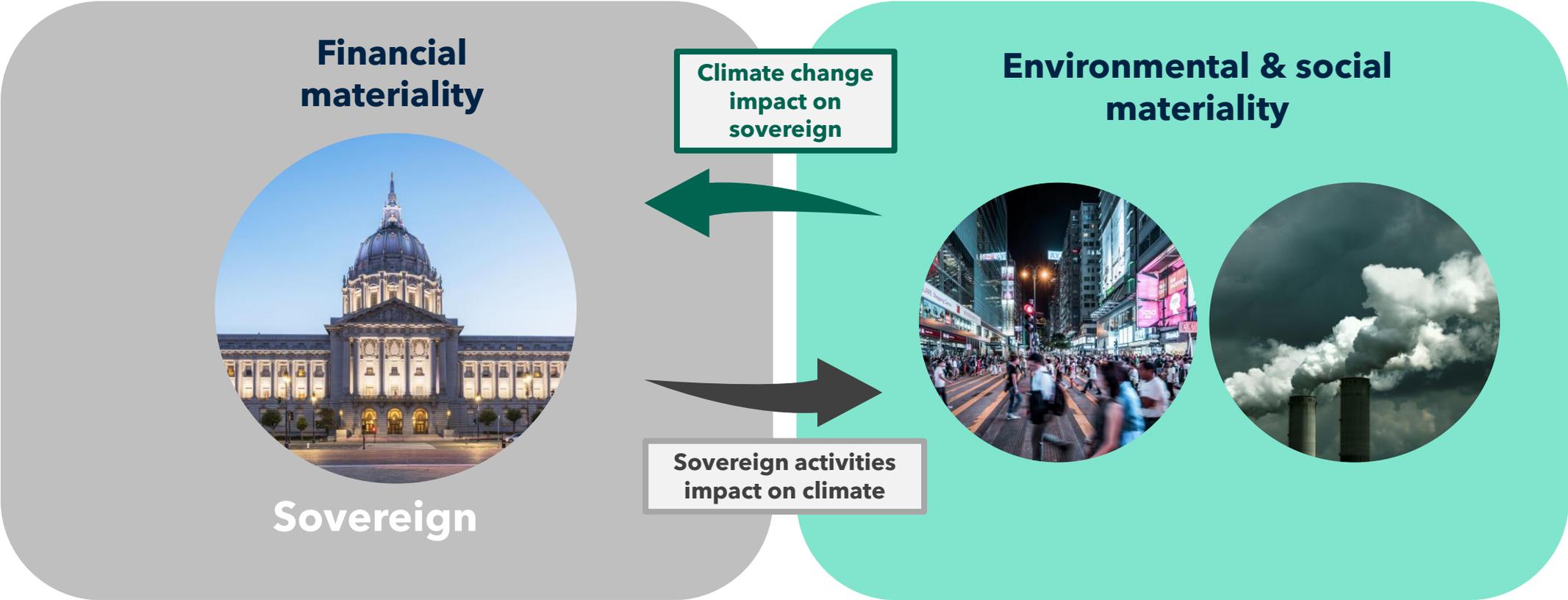


SSA Sustainable debt outstanding by currency

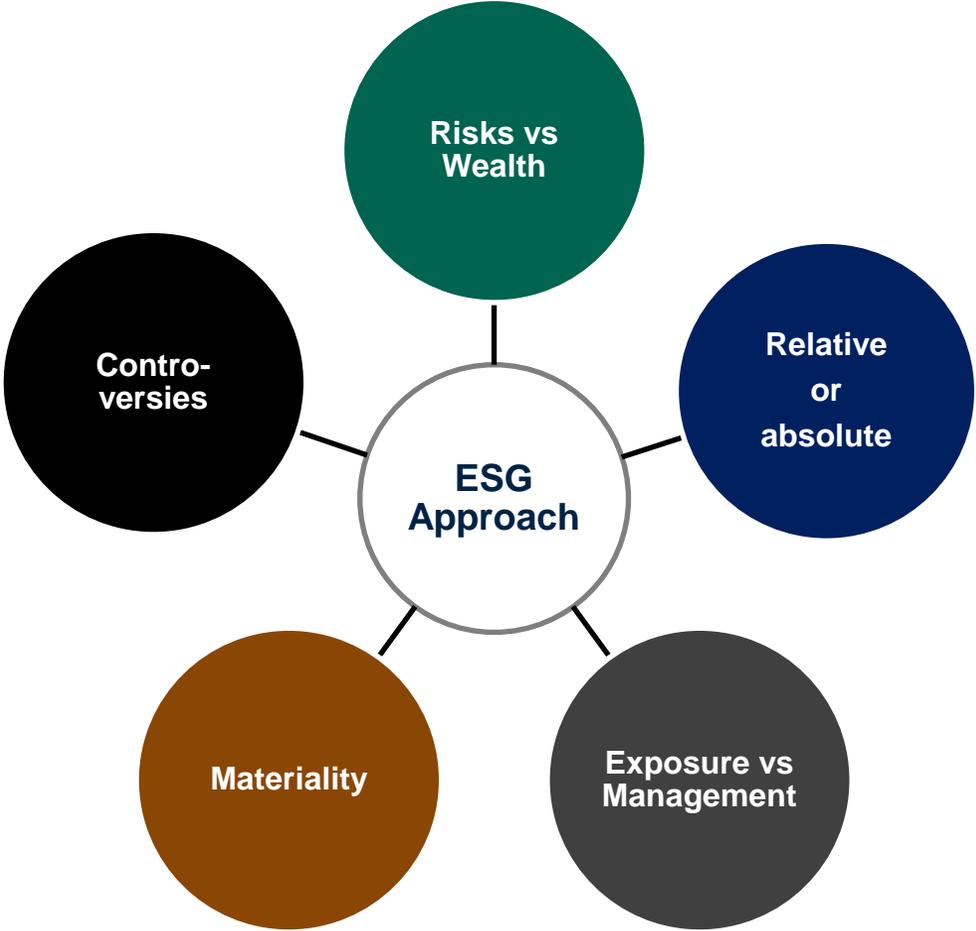


*Excluding securitized debt (ABS, CMBS, MBS, Covered, CMO, CLO, CDO)

Double materiality for Sovereign Entities



Different approaches, comparison among providers



Should ESG ratings converge?

- They are not answering the same question
- They don't use the same data sources: RepRisk is based on alternative data like News analysis
- Materiality of E, S and G is different

Table 4: Cross-sectional (countries) correlations between the selected ESG providers.

Cross-sectional (countries) correlations	MSCI	Sustainalytics	Beyond Ratings	RepRisk
MSCI	1			
Sustainalytics	0.93	1		
Beyond Ratings	0.93	0.95	1	
RepRisk	0.72	0.78	0.86	1

Source: Bouyé and Menville (2021).

UN PRI 14 indicators

UNPRI taxonomy (2019)

Natural resources	the availability and quality of biodiversity, water, air and soil; and land use (urban, agricultural and forests).
Physical risks	the physical effects of climate change (such as weather volatility, sea-level rise) and natural disaster risks (volcanic eruptions and earthquakes).
Energy transition risk	regulatory factors and technological developments associated with the global energy transition to a less carbon-intensive global economy
Energy security	the availability and management of (non)-renewable energy resources; and resource depletion.
Demographic change	population trends; age distribution; and rates of immigration
Education and human capital	availability of and access to education; quality of educational attainment; and employment rights.
Living standards and income inequality	respect for human rights (including the right to life, the right to freedom of association and the right to health); measures of poverty and income inequality; gender inequality; unemployment rates; public sector wages; availability of and access to healthcare, personal safety and housing; food security and obesity
Social cohesion	political freedom and representation; levels of trust in institutions and politicians; social inclusion and mobility; prevalence of civic organisations; degree of social order; and capacity of political institutions to respond to societal priorities.
Institutional Strength	strength of institutional and regulatory frameworks; independence of institutions; quality and availability of public data; prevalence of corruption; rule of law; ease of doing business; and business climate.
Political stability	political rights and civil liberties; political upheaval and violence in society; freedom of expression; press freedom; and freedom of information and speech.
Government effectiveness	quality of bureaucracy and administration; policy planning and implementation capabilities; and independence of the civil service from political interference
Regulatory effectiveness	efficiency of regulatory systems and policy implementation; predictability of policy making; ease of doing business; and business climate.
Rule of law	property rights; institutional and regulatory framework; and independence of the judiciary
Corruption	accountability and transparency of institutions; money laundering/illicit financial flows

Beyond Ratings: 18 ind.

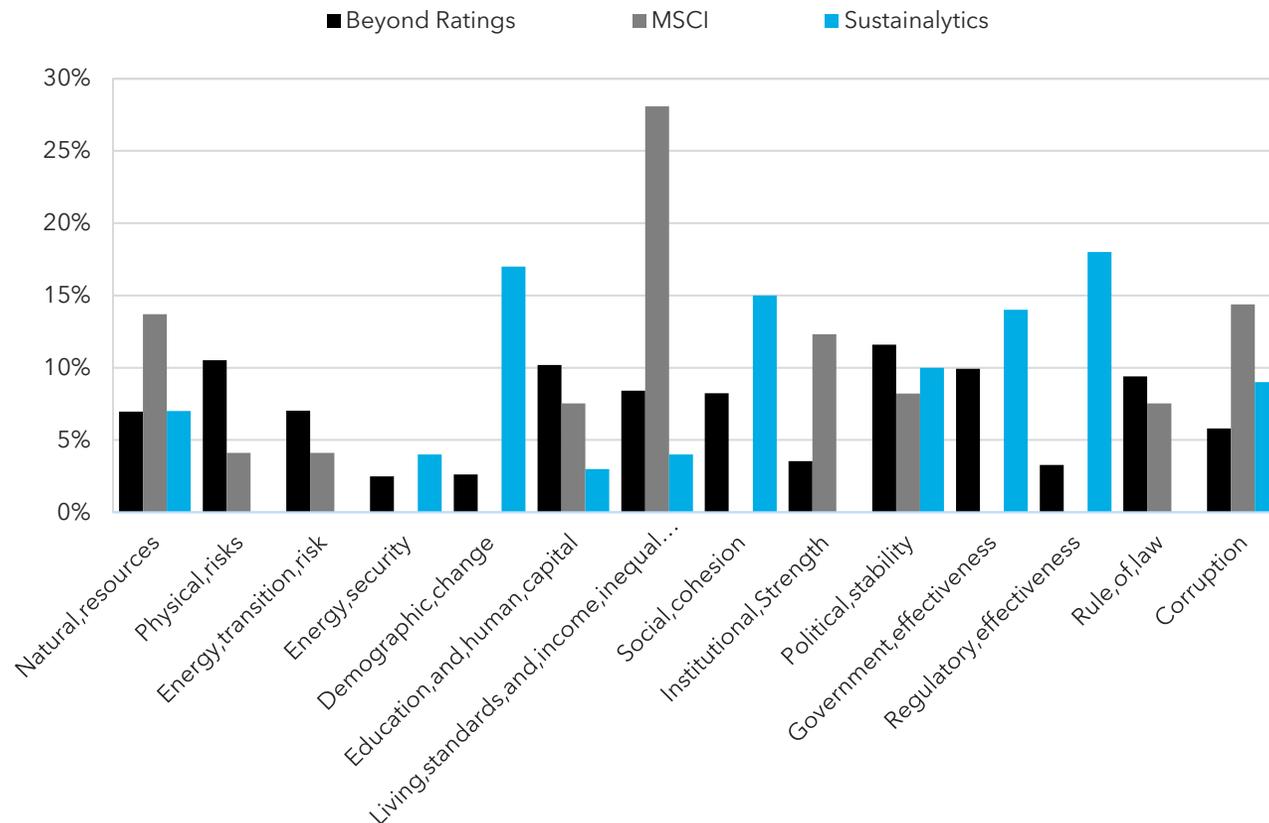
MSCI : 27 ind.

Sustain-alytics: 42 ind.

Source: UNPRI, Bouyé and Menville (2021).

Materiality of UNPRI themes within ESG Sovereign ratings

Materiality of themes within ESG ratings



Common themes to the 3 raters:

- Natural resources
- Education and Human Capital
- Living standards
- Political Stability
- Corruption

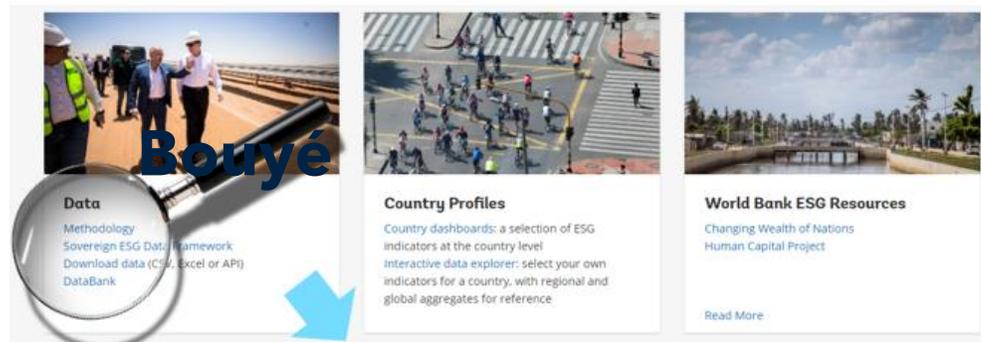
Risks vs Wealth:

- Sustainalytics is focused on Wealth, therefore is not including Energy Transition Risk or Physical Risks but has the highest weight for institutional capital (G)
- Beyond Ratings integrates more environmental risks
- MSCI focuses on Living standard and Governance (very correlated with GDP).

WORLD BANK SOVEREIGN ESG DATA TOOL

ESGData.worldbank.org

World Bank data platform provides country-level sustainability performance information to increase transparency and support investment aligned with sustainable development



Sovereign ESG Data Methodology

The World Bank's ESG Data Framework provides information on 17 key sustainability themes spanning environmental, social, and governance categories:

Environment	Social	Governance
Emissions & pollution	Education & skills	Human rights
Natural capital endowment & management	Employment	Government effectiveness
Energy use & security	Demography	Stability & rule of law
Environment/climate risk & resilience	Poverty & inequality	Economic environment
Food security	Health & nutrition	Gender
	Access to services	Innovation

- The ESG Data Framework incorporates 67 different indicators that are pertinent to stable long-term economic growth and relevant to the 17 SDGs.
- The framework organizes data into themes the World Bank believes are crucial for financial sector representatives to consider when assessing the contribution of investments or policies to sustainable development.

Very high predictivity

- All models return very high R squared, highlighting the **strong dependence** of ESG Sovereign Ratings to World Bank ESG indicators

Table 7: R² values of the test data for the five models: stepwise, principal components, ridge, lasso and elastic-net regressions. The training/test data split for is 80/20.

R ² test	MSCI	Sustain.	BR	Reprisk
Stepwise	0.87	0.93	0.96	0.80
PCR	0.89	0.91	0.97	0.78
Ridge	0.90	0.93	0.98	0.78
Lasso	0.88	0.93	0.97	0.79
ElasticNet	0.88	0.93	0.98	0.79
# countries	138	125	106	140

Lasso is selected to analyze results in detail due to the capacity of reducing the number of indicators.

E and S pillars - results

Variable	MSCI	Sust.	BR	RepRisk
Constant	0.006	(0.034)	(0.167)	0.005
PM2.5 air pollution, mean annual exposure (micrograms per cubic meter)	-	(0.040)	(0.039)	-
Adjusted savings: natural resources depletion (% of GNI)	-	0.065	-	-
Adjusted savings: net forest depletion (% of GNI)	-	(0.059)	-	-
Forest area (% of land area)	0.070	0.018	-	-
Terrestrial and marine protected areas (% of total territorial area)	0.015	0.042	0.020	(0.026)
Population density (people per sq. km of land area)	-	(0.034)	(0.038)	-
Agricultural land (% of land area)	-	(0.033)	-	0.070
Agriculture, value added (% of GDP)	-	(0.085)	(0.039)	-
Food production index (2004-2006 = 100)	-	0.031	0.016	(0.109)
Labor force participation rate, total (% of total population ages 15-64) (modeled ILO estimate)	0.039	-	-	-
Unemployment, total (% of total labor force) (modeled ILO estimate)	-	(0.060)	(0.037)	-
Fertility rate, total (births per woman)	-	-	-	-
Life expectancy at birth, total (years)	-	0.147	0.033	-
Population ages 65 and above (% of total population)	0.016	0.021	0.052	-
Cause of death, by communicable diseases and maternal, prenatal and nutrition conditions (% of total)	-	-	(0.017)	-
Mortality rate, under-5 (per 1,000 live births)	-	0.101	-	(0.022)
Prevalence of overweight (% of adults)	0.083	0.027	0.024	0.039
Access to clean fuels and technologies for cooking (% of population)	0.021	0.118	0.166	-
Access to electricity (% of population)	-	0.055	0.032	-

Governance Bias

	MSCI	Sust.	BR	RepRisk
Strength of legal rights index (0=weak to 12=strong)	0.020	-	-	0.001
Voice and Accountability: Estimate	0.132	0.059	0.122	0.101
Government Effectiveness: Estimate	0.178	0.087	0.205	-
Regulatory Quality: Estimate	0.266	-	0.072	-
Control of Corruption: Estimate	0.092	0.048	0.130	0.451
Net migration	-	(0.008)	-	-
Political Stability and Absence of Violence/Terrorism: Estimate	0.059	0.099	0.031	0.231
Rule of Law: Estimate	-	0.278	0.154	0.074
GDP growth (annual %)	-	(0.082)	0.014	-
Individuals using the Internet (% of population)	0.122	0.118	0.075	-
Proportion of seats held by women in national parliaments (%)	0.024	-	0.014	(0.046)
Ratio of female to male labor force participation rate (%) (modeled ILO estimate)	0.016	0.091	0.062	-
Scientific and technical journal articles	-	0.016	0.010	-

Source: Bouyé and Menville (2021).

Regression of scores

Main takeaways

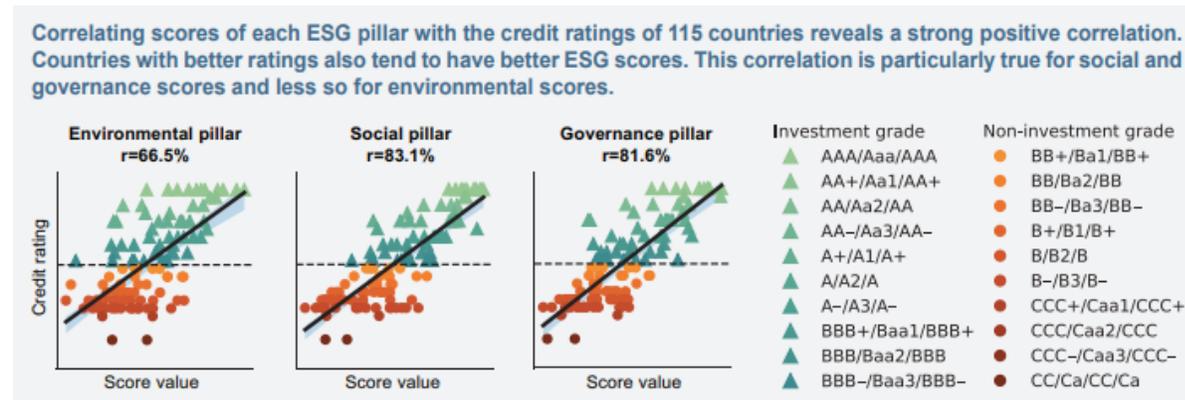
- Convergence in the signs of coefficients – except Reprisk
- Very small number of Environment indicators
- Very high focus on Government
- High Focus of Reprisk on Corruption
- WB indicators don't include physical risks or energy efficiency and still the R2 are very high but may be reflected in other components (access to clean fuel for cooking..)

	MSCI	Sust.	BR	RepRisk
Environment Pillar	7%	22%	11%	18%
Social Pillar	14%	29%	26%	5%
Governance Pillar	79%	49%	63%	77%

Source: Bouyé and Menville (2021).

ESG factors and sovereign credit ratings

- Sovereign credit ratings and sovereign ESG scores are highly correlated, especially for governance and social scores
- This correlation lessens the lower the income group

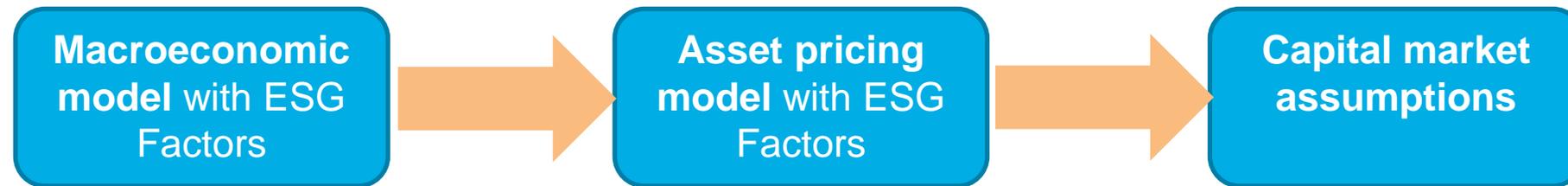


Source: Gratcheva, Gurhy, Skarnulis, Stewart, Wang (2022).

- Risks that are easier to understand and model are more explicitly included in credit assessments
- Greater granularity of current rating scales would improve the financial materiality of ESG factors being reflected on the credit rating scale

Strategic asset allocation and ESG

- Integrating ESG factors in the asset allocation is a challenge, especially for investors with short- to medium-term investment horizons

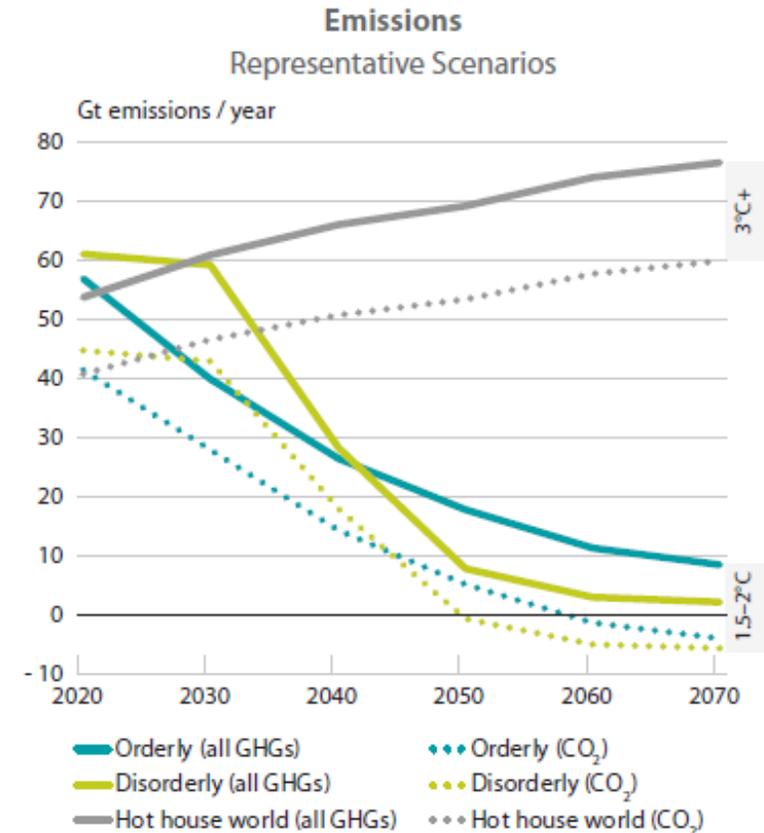


- Modern portfolio theory can be extended to build “ESG optimal portfolios”. It allows to exhibit tradeoff between risk, return and ESG scores. However, it faces the same issues as standard models, especially related to calibration and robustness of the model.

Climate scenarios

NGFS define a set of climate scenarios that explore the impact of climate change and climate policy to the economy and the financial system to provide a common reference framework

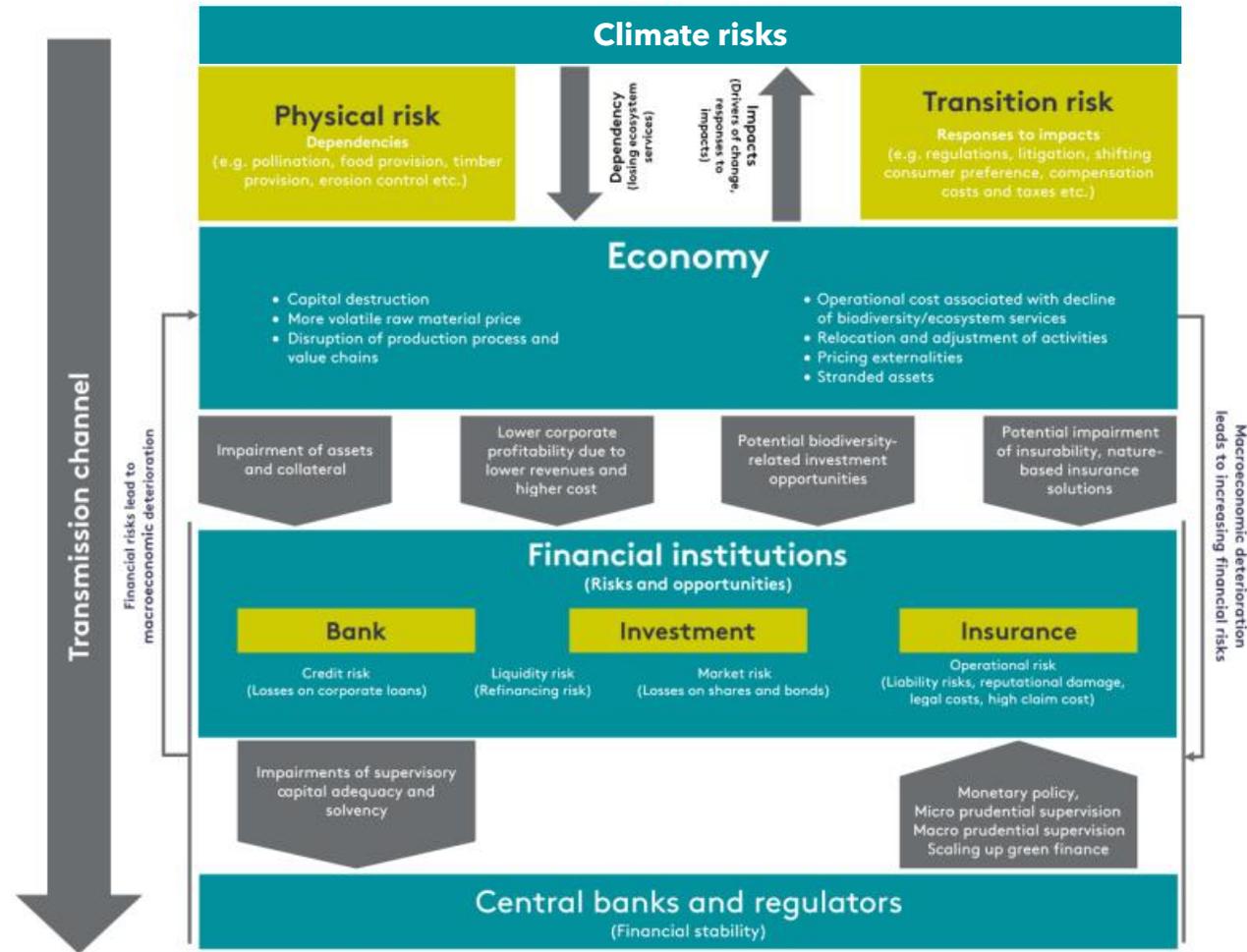
- Three representative scenarios that represent lower and higher risk outcomes:
 - **Orderly:** Early, ambitious action to a net zero CO₂ emissions economy
 - **Disorderly:** Action that is late, disruptive, sudden and/or unanticipated
 - **Hot house world:** Limited action leads to significant global warming and severe physical risks
- Scenarios aim at estimating the **size of transition** to a zero-carbon economy and **physical risks** of climate change



Source: NGFS Climate Scenarios Database.

Climate scenarios

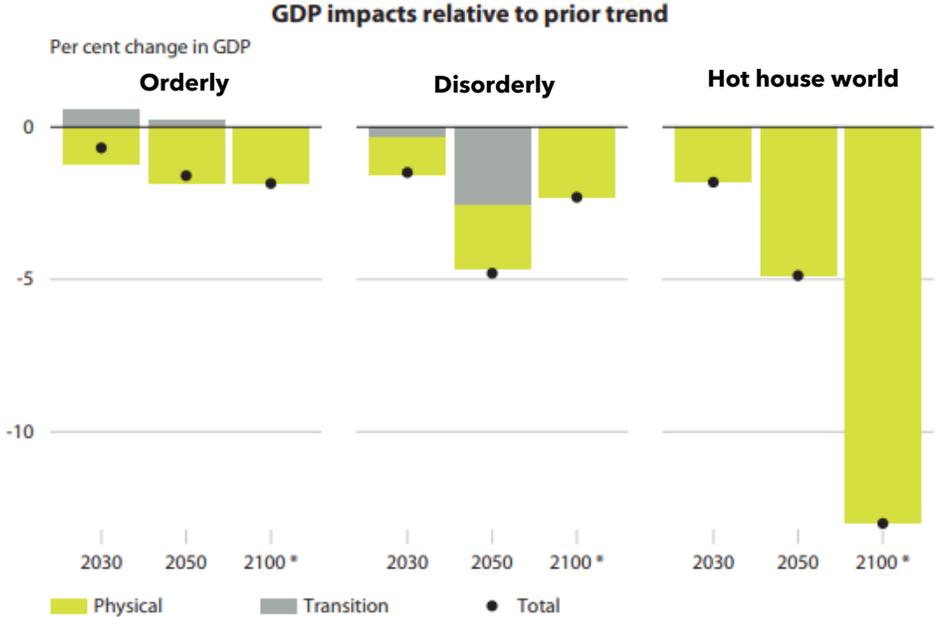
Climate risks affect the economy and financial system through different channels



Source: NGFS.

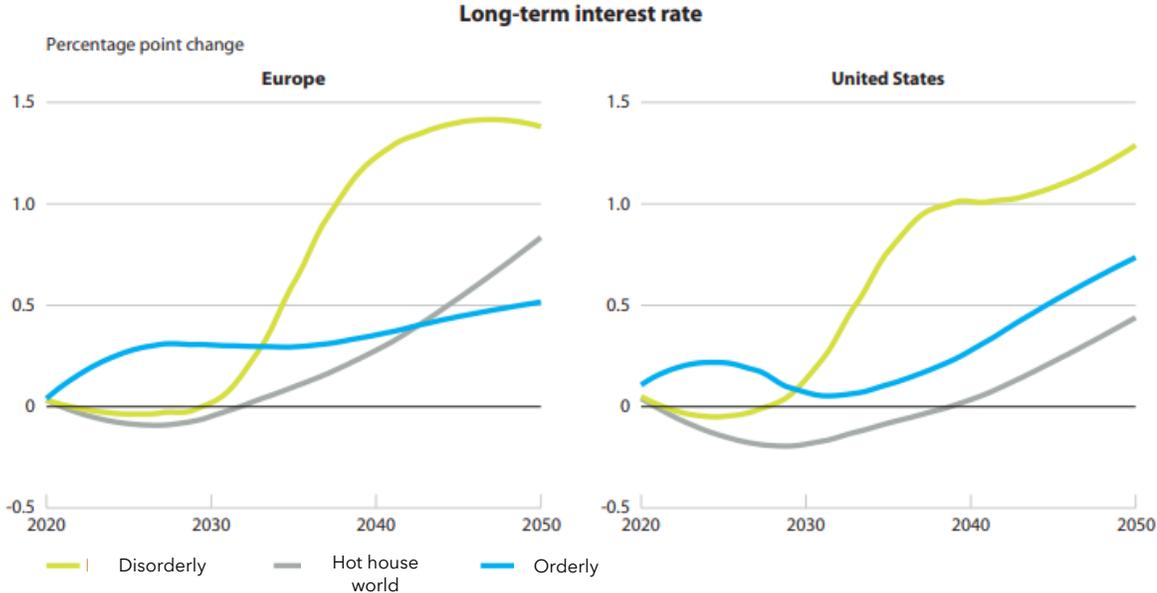
Climate scenarios

NGFS scenarios also capture the economic and financial impact from transition risk and physical risk channels



Source: IIASA NGFS Climate Scenarios Database, NiGEM based on REMIND. IAM data and damage estimates from Kalkuhl & Wenz (2020).

Source: NGFS.



Results have been smoothed as a 5 year centred average.
 Source: IIASA NGFS Climate Scenarios Database, NiGEM based on REMIND. IAM data and damage estimates from Kalkuhl & Wenz (2020).

Multilateral Development Banks

From SDGs to Impact Reporting



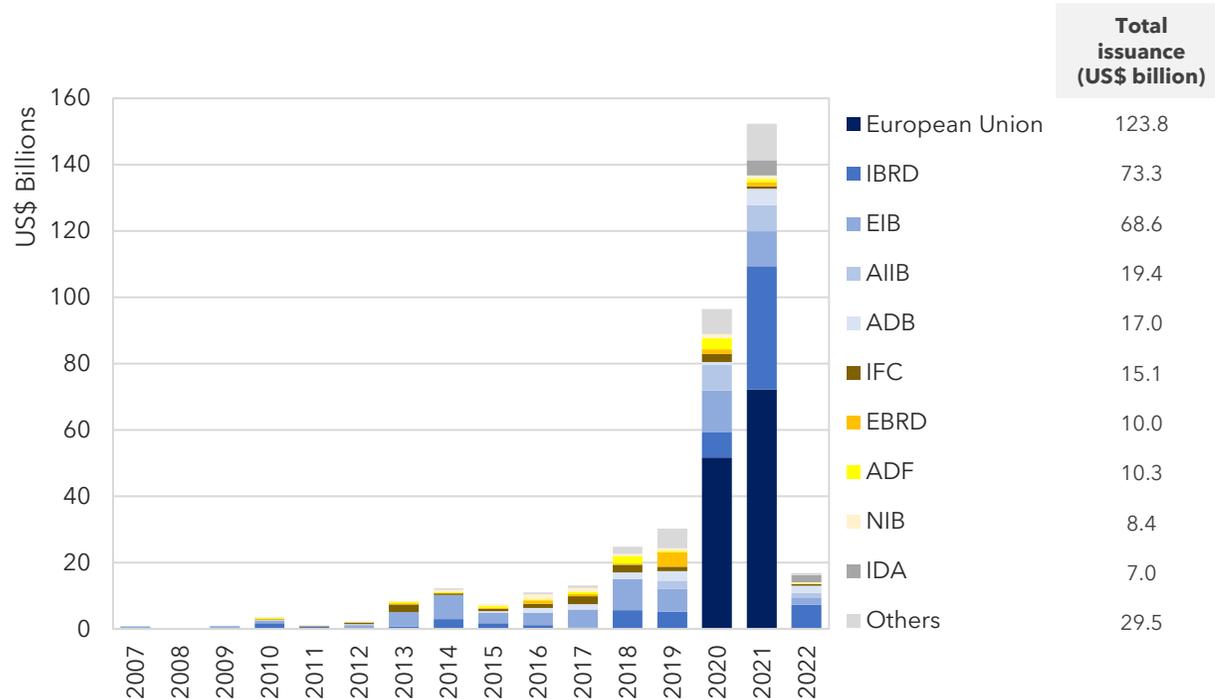
THE WORLD BANK
Treasury | RAMP

20
YEAR
ANNIVERSARY

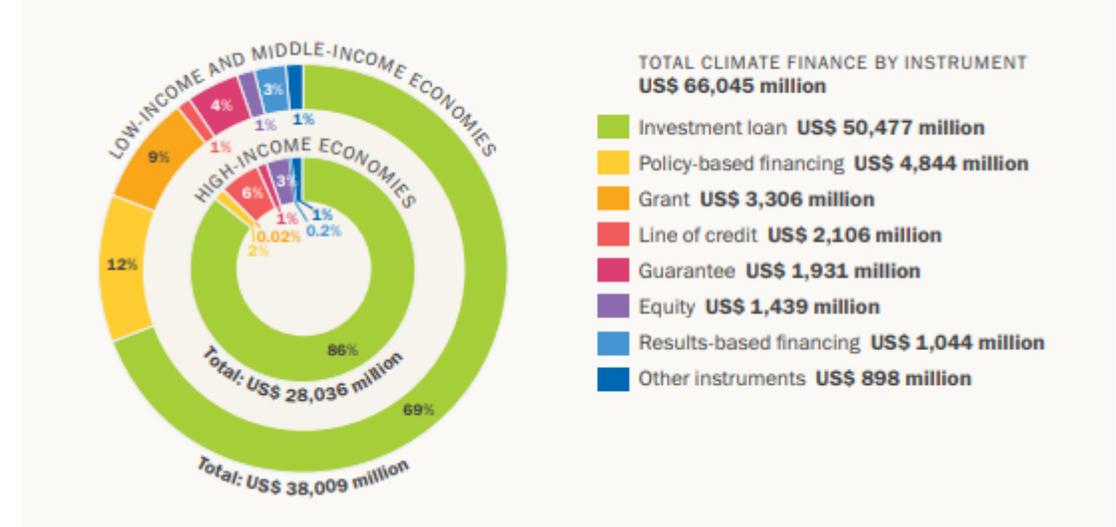
Multilateral Development Banks

- MBDs committed US\$66 billion in climate finance and US\$85 billion in co-finance in 2020
- Adaptation vs. mitigation finance
- Consensus on aligning to the Paris Agreement Objectives

Supras GSS(S)* bond-issuance



MDBs climate finance by type of instrument in 2020



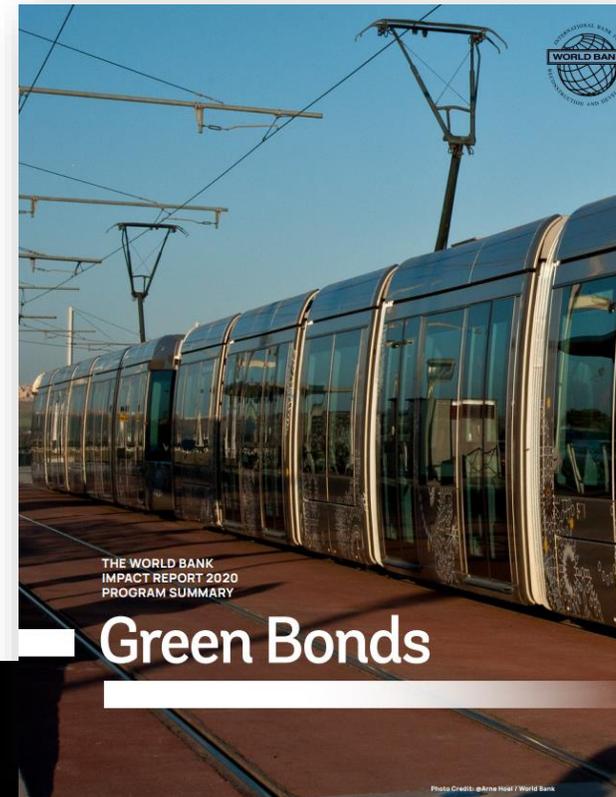
Source: 2020 Joint MDB report on climate finance.

Sustainable Development Bonds

IBRD offers bonds using two labels



World Bank Sustainable Development Bonds aligned with Sustainability Bond Guidelines published by ICMA



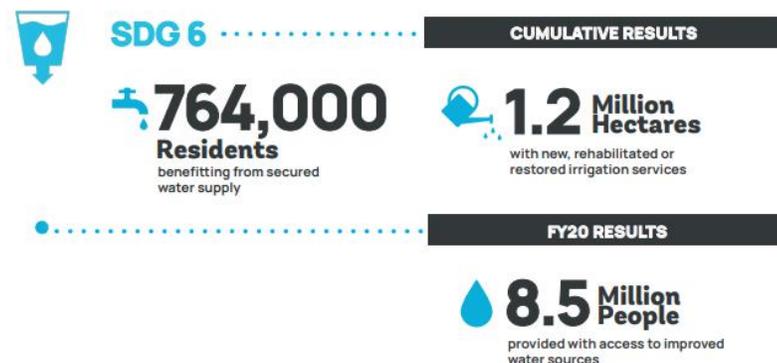
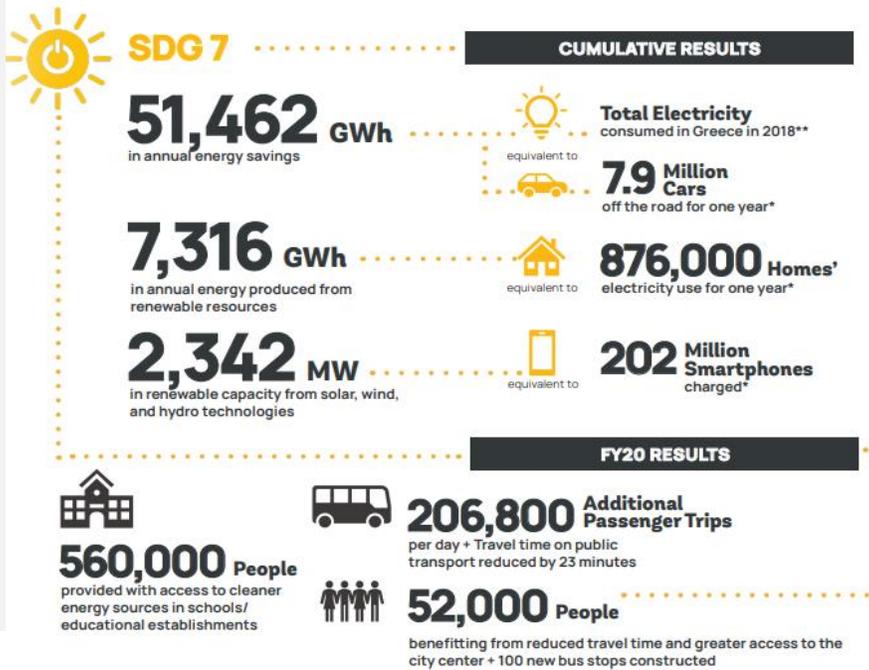
World Bank Green Bonds aligned with Green Bond Principles published by ICMA

2020 Impact Report: Green Bonds

Transparency Around Use of Proceeds and Expected Impact



Read the [2020 World Bank \(IBRD\) Impact Report](#)



Issued over **USD 16 billion**

185 World Bank Green Bonds

23 currencies since 2008

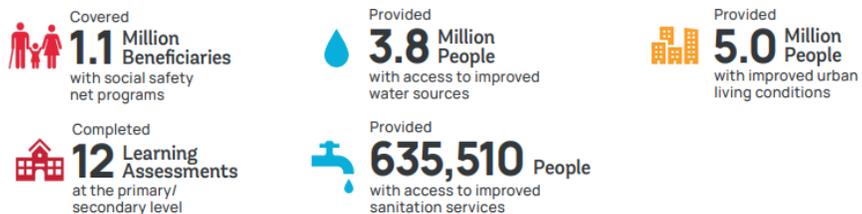
2020 Impact Report: Sustainable Development Bonds

Holistic Approach Uses SDBs as a Framework

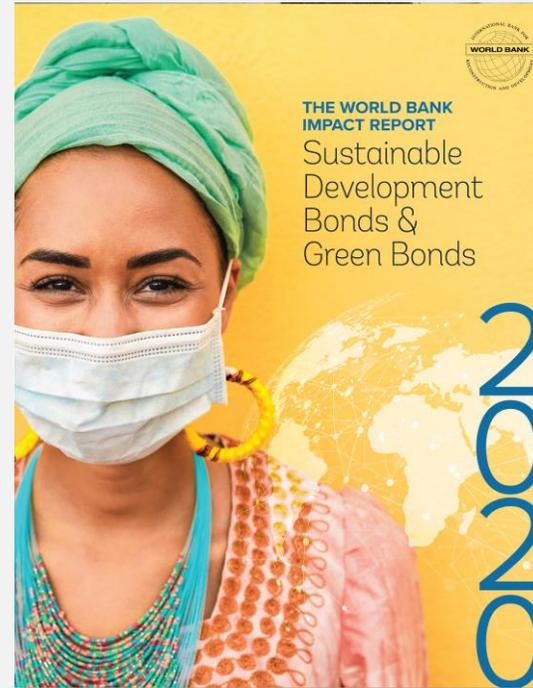
Sustainable & Inclusive Growth



Human Capital



Resilience



Read the [2020 World Bank \(IBRD\) Impact Report](#)

Project results aggregated for **599 projects** active in FY20.

Expected results aggregated for **100 projects** added to the Sustainable Development Bond portfolio in FY20.

2020 Impact Report: Project-Level Mapping to the SDGs

Representing the number of targets per SDG that were mapped to the 100 new projects in the FY20 World Bank (IBRD) project portfolio.

Project/SDGs	1 NO POVERTY	2 ZERO HUNGER	3 GOOD HEALTH AND WELL-BEING	4 QUALITY EDUCATION	5 GENDER EQUALITY	6 CLEAN WATER AND SANITATION	7 AFFORDABLE AND CLEAN ENERGY	8 DECENT WORK AND ECONOMIC GROWTH	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	10 REDUCED INEQUALITIES	11 SUSTAINABLE CITIES AND COMMUNITIES	12 RESPONSIBLE CONSUMPTION AND PRODUCTION	13 CLIMATE ACTION	14 LIFE BELOW WATER	15 LIFE ON LAND	16 PEACE, JUSTICE AND STRONG INSTITUTIONS	17 PARTNERSHIPS FOR THE GOALS
P160594	2	1	0	2	1	0	0	0	0	2	0	0	0	0	0	0	0
P166564	1	1	0	0	0	0	0	1	1	2	0	0	0	0	1	0	1
P169779	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1
P168911	0	0	0	7	0	0	0	1	0	0	0	0	1	0	0	0	1
P173767	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	2
P170329	1	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	2
P169624	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
P164260	0	0	0	0	0	7	1	0	1	0	1	1	0	0	0	0	1
P167455	2	4	0	0	0	6	0	0	4	2	1	2	0	0	2	0	4
P164588	0	5	0	0	0	0	0	1	0	0	0	1	5	0	4	0	1
P165055	0	0	2	0	0	7	0	0	4	0	1	1	0	0	0	0	2
P165695	2	0	2	0	1	5	1	0	0	0	2	1	0	0	0	0	2
 P160628	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2
P158124	0	1	0	0	0	6	0	1	3	0	4	1	0	0	1	0	1

[See the full SDG Mapping here](#)

Key
1
2
3
4
5
6
7

 Indicates Green Bond Project

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